



$A \rightarrow \Omega$
Probes

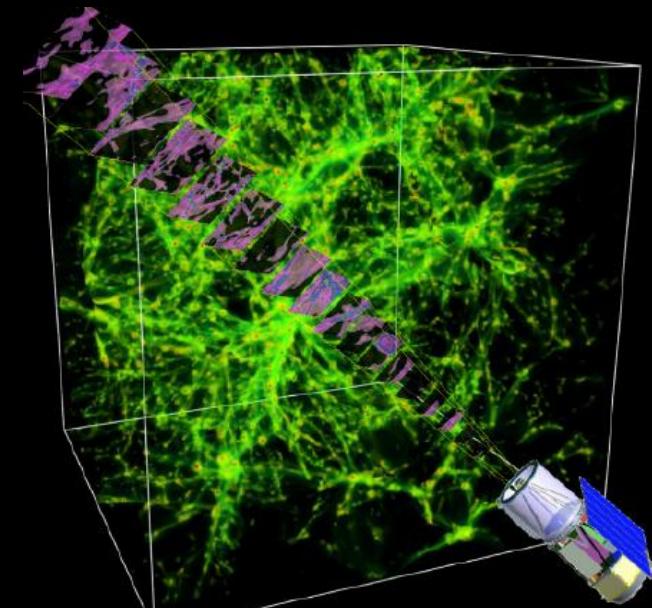
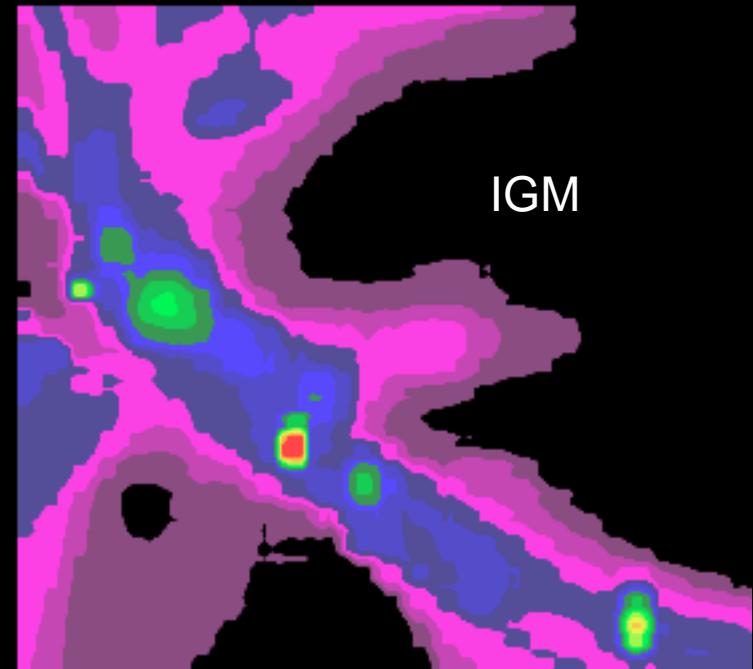
Christopher Martin
Caltech

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*Following the flow of
Baryons from the
Cosmic Web to Planets*

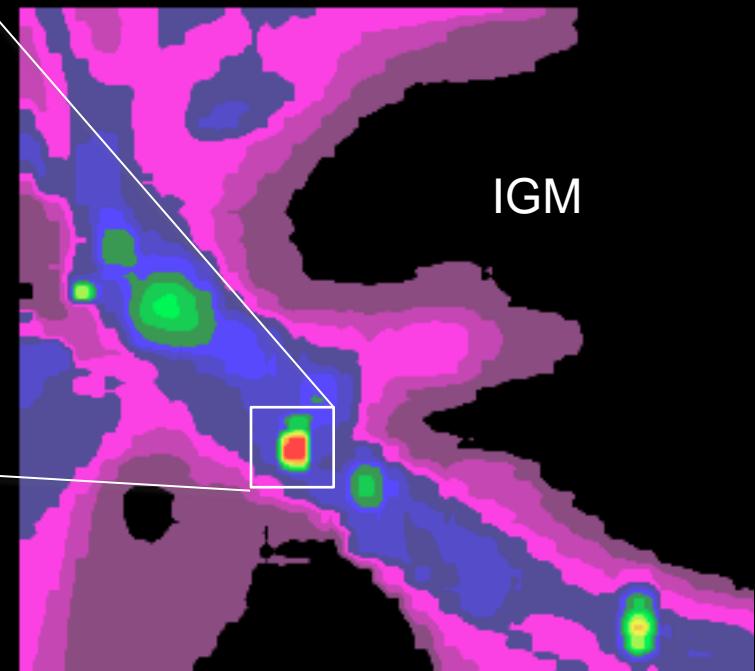
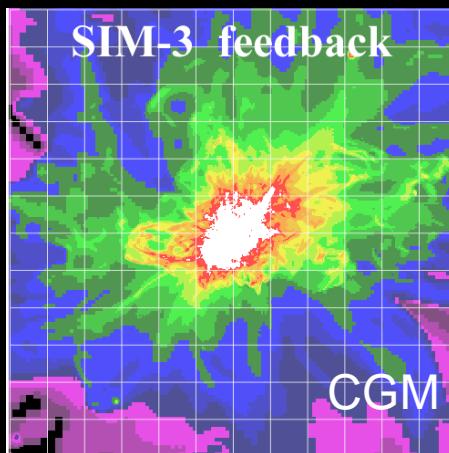
IGM ($\delta \sim 1-100$)

- α : High Resolution UV Absorption Spectroscopy (Multi-object? Tomography?)
- α : Mod Resolution UV Emission Integral Field Spectroscopy (IFS)
- α : Mod Resolution Multi-Object-Spectroscopy (MOS)



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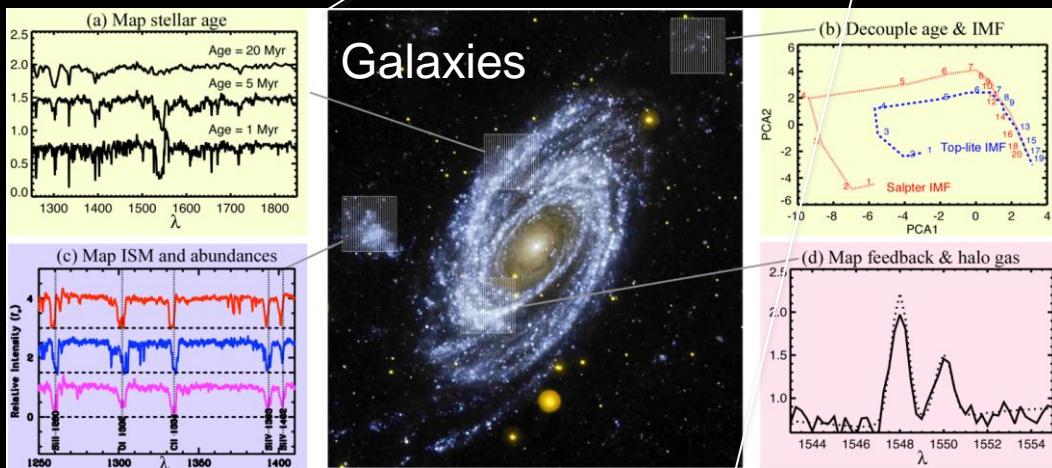
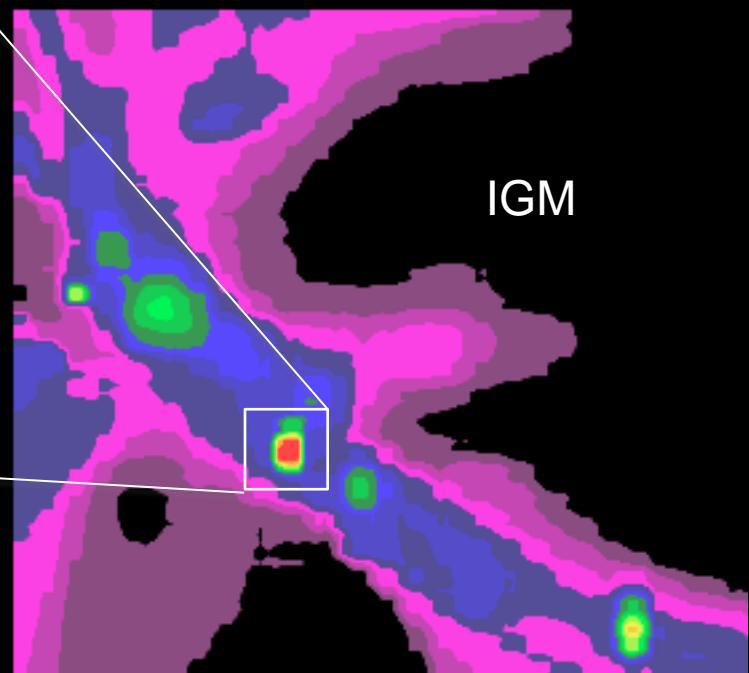
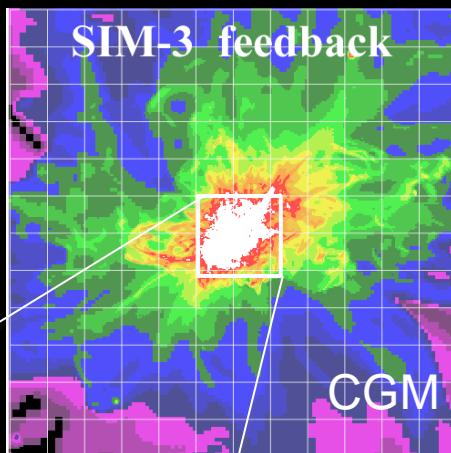


CGM ($\delta \sim 10^2 - 10^4$)

- α : High Resolution UV Absorption Spectroscopy (Multi-object? Tomography)
- α : Mod Resolution UV Emission Integral Field Spectroscopy (IFS)
- α : Mod Resolution Multi-Spectroscopy

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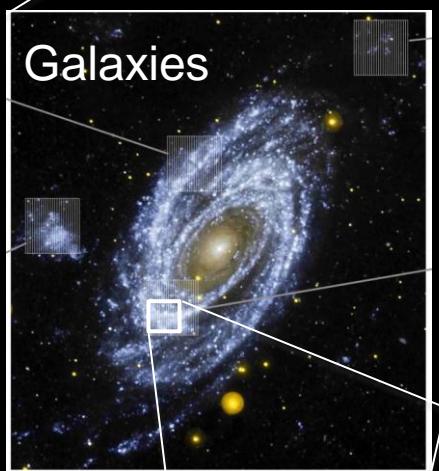
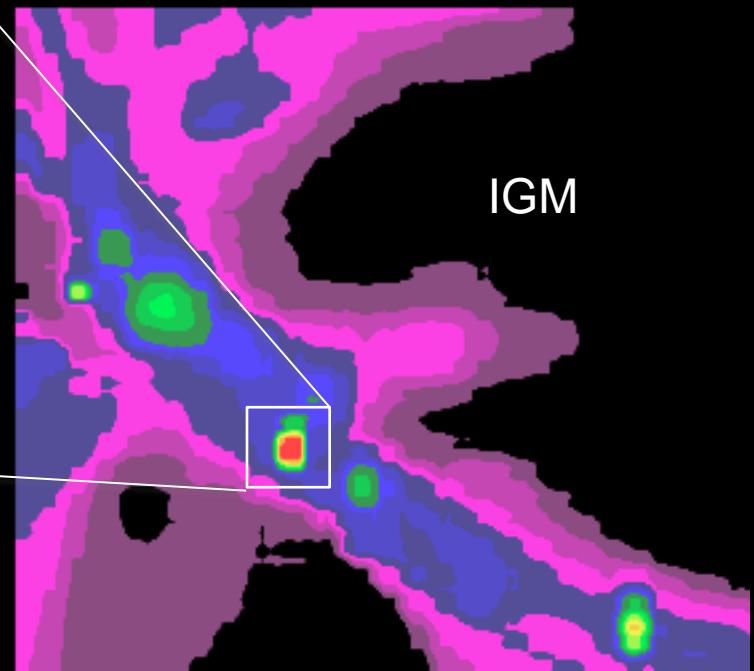
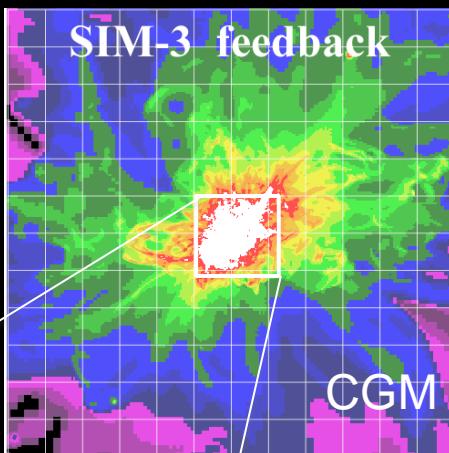


Galaxies ($\delta \sim 10^4 - 10^8$)

- α : Mod-High Resolution UV Emission IFS
- α : Mod Resolution Multi-Object Spectroscopy
- α : Wide field UV/Optical Imaging
- Φ : Far IR/Sub mm imaging/spectroscopy
- Ω : High contrast imaging (Galaxy/AGN co-evol)

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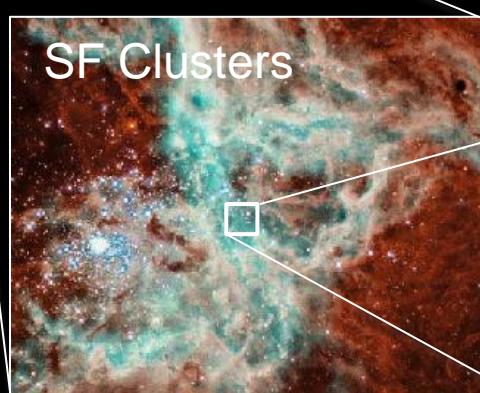
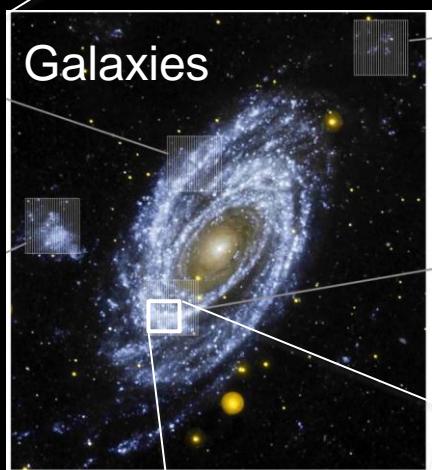
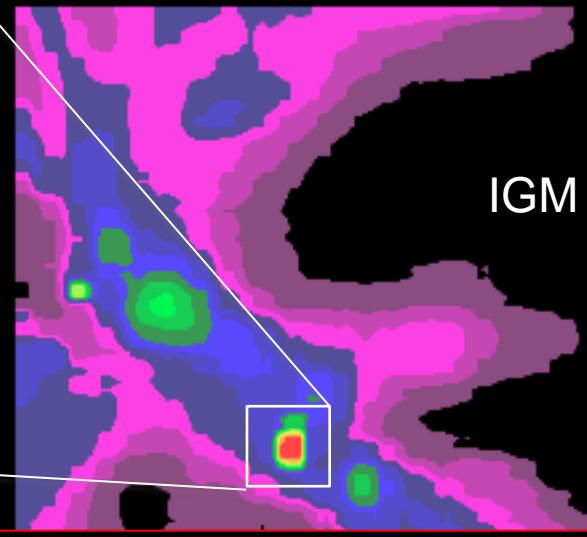
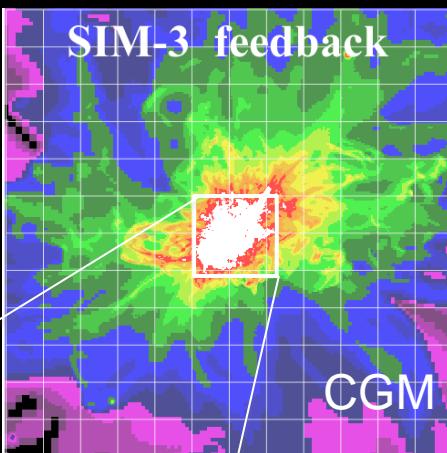


Clusters/GMCs ($\delta \sim 10^8$ - 10^{10})

- ⟨ : Wide field UV/Optical Imaging
- ⟨ : Mod-High Resolution UV Emission IFS
- ⟨ : Mod Resolution UV Multi-Object Spectroscopy
- Φ: Far IR/Sub-mm imaging/spectroscopy

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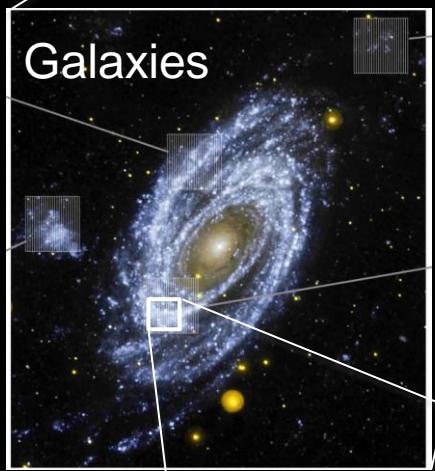
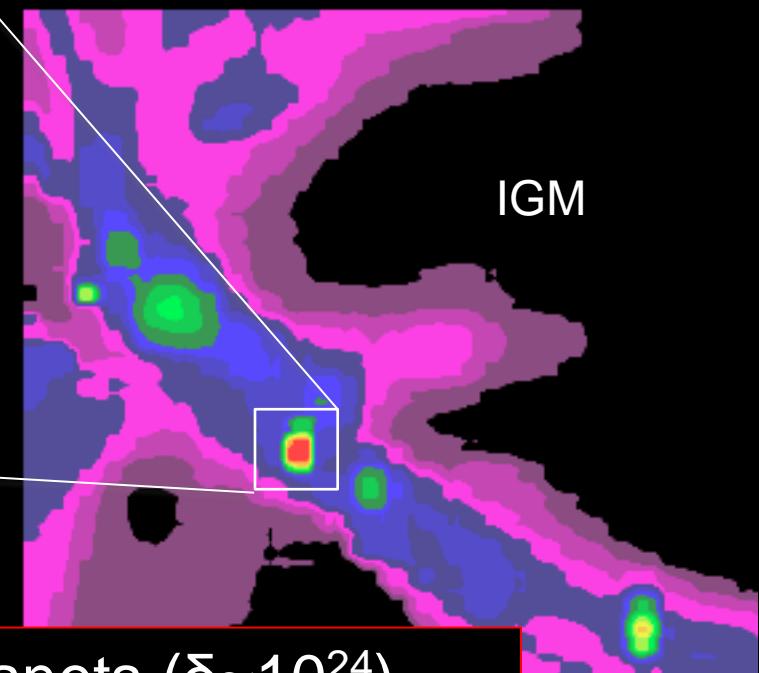
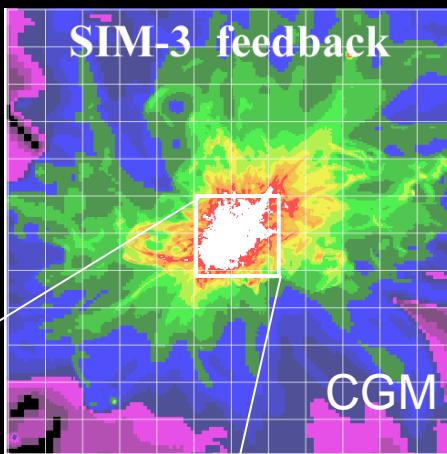
Protostars/PPDs/Young Stars ($\delta \sim 10^{16}-10^{19}$)

- Φ : Far IR/Sub mm imaging/spectroscopy
- Ω : High Contrast optical Imaging/Sp
- α : Wide field UV/Optical Imaging
- α : High Resolution UV spectroscopy
- α : Mod-High Angular Resolution UV Emission IFS



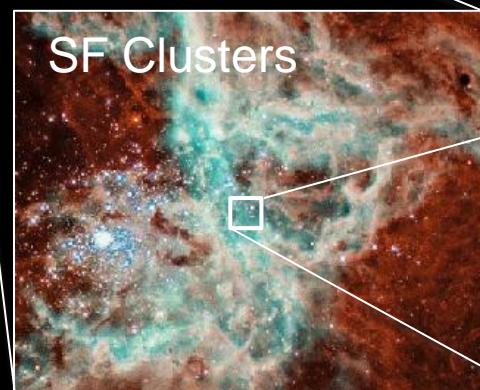
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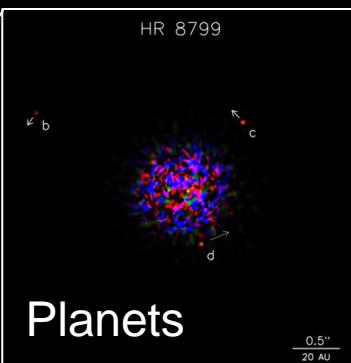


Giant Planets ($\delta \sim 10^{24}$)

- Ω : High Contrast Imaging
- Ω : High Angular Resolution,
Low Spectral Resolution IFS



PPDs



Probe 1 – Alpha α

- Wide-field
 - ~1.5 m
 - Wide-field UV/O imaging
 - Massively multi-object UV Spectroscopy
 - low, medium, high R?
 - Wide-field UV Integral Field Spectrograph
- Science
 - IGM/CGM emission/absorption, tomograph?
 - Galaxy gas, star formation history, feedback
 - Star Formation Region gas physics, PDRs
 - Protoplanetary Disk gas physics
 - General astrophysics
- Technology Demonstration
 - High efficiency UV coatings, detectors

Probe 2 – Phi Φ

- Far IR/Sub-mm
 - Single aperture imaging and spectroscopy (SPICA?)
 - Science
 - Obscured Star Formation region gas physics, PDRs, dust
 - Protoplanetary Disk gas physics
 - Conditions for Habitability of Exoplanetary Systems
 - General astrophysics
 - Technology Demonstration
 - Balloon interferometer?
- metry
-
- The diagram illustrates the two proposed probes. On the left, a large satellite-like probe is shown against a red nebula background, labeled 'SPICA'. In the center, the word 'metry' is written vertically. To the right, the word 'or' is placed between two smaller diagrams. The top diagram shows a single large dish antenna on a platform, labeled 'SPIRIT'. The bottom diagram shows two smaller dish antennas connected by a beam splitter, also labeled 'SPIRIT', representing a balloon interferometer.

Probe 3 – Omega Ω

- Narrow-field
 - ~1.5 m
 - Dedicated O/UV (0.1-1 [2?] μm)
 - High resolution imaging
 - High contrast imaging
 - High resolution/contrast imaging spectroscopy
- Science
 - Physics of star formation
 - Proto-planetary disk structure
 - Giant planets imaging & characterization
 - AGN formation, evolution, & feedback
- Technology demonstration
 - High-contrast imaging
 - UV compatibility
 - Starshade?